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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/068,943 | 02/07/2002 | Wayne E. Prentice | 82293THC | 2325 |
| 7590 | 03/11/2005 | | | EXAMINER |
| Patent Legal Staff Eastman Kodak Company 343 State Street Rochester, NY 14650-2201 | | | HERNANDEZ, NELSON D | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2612 | |

DATE MAILED: 03/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/068,943 | WAYNE E. PRENTICE | |
| | Examiner | Art Unit | |
| | Nelson D. Hernandez | 2612 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 07 February 2002.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-20 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-4,8-12,16 and 17 is/are rejected.
 7) Claim(s) 5-7, 13-15 and 18-20 is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 07 February 2002 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date 2/7/2002.

4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.
 5) Notice of Informal Patent Application (PTO-152)
 6) Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because figures **2** and **3** need the Histograms graph to have axis identified or labeled. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claims 1, 3, 4, 8-12, 16 and 17** are rejected under 35 U.S.C. 102(b) as being anticipated by Sawachi, US Patent 5,512,947.

Regarding **claim 1**, Sawachi discloses a method of correcting for dark current in a solid state image sensor, comprising the steps of: capturing an image with the image sensor (Figs. 1: 3 and 2: 3) to produce a digital image having pixel values; correcting the pixel values with a dark level correction value (Using Microcomputer in fig. 2:13); employing a control system to adjust the dark level correction (Using comparator in fig. 2: 47 to adjust the correction value) value to drive the number of pixels having values lower than a predetermined value (Counted by integrator in fig. 2: 49) chosen to represent dark scene content to a predetermined range (Col. 2, lines 10-25; col. 3, lines 18-37; col. 4, lines 60-65; col. 5, line 22 – col. 6, lines 23; col. 6, line 48 – col. 7, line 16).

Regarding **claim 3**, Sawachi discloses the sensor (Figs. 1: 3 and 2: 3) captures a stream of digital images, and wherein the control system performs the steps of: sampling a digital image from the stream of dark current corrected digital images; generating a count (Using integrator, see fig. 2; 49) of the number of pixel values in the sampled digital image that are less than a predetermined value; generating a dark level correction value adjustment (Using Microcomputer in fig. 2:13) based on the pixel value

count; and applying the adjustment to the dark level correction value (Using clamp circuits in fig. 2: 29 and 2: 37 based on data comparator in fig. 2: 47 to adjust the correction value) (Col. 2, lines 10-25; col. 3, lines 18-37; col. 4, lines 60-65; col. 5, line 22 – col. 6, lines 23; col. 6, line 48 – col. 7, line 16).

Regarding **claim 4**, Sawachi discloses a step of sub-sampling the sampled digital image to produce a sub-sample of pixel values from the sampled image and employing the sub-sample of pixel values to generate the count (Col. 5, line 22 – col. 6, line 24).

Regarding **claim 8**, Sawachi discloses a method of correcting for dark current in a solid state image sensor, comprising the steps of: capturing a first image having a variable dark level (Using sensor in fig. 1: 3); converting the first captured image to digital pixel values (A/D in fig. 1: 7); processing the digital pixel values to determine the number of pixels having values below a dark level threshold pixel value (Using data comparator in fig. 2: 49); providing an dark correction (Using microcomputer in fig. 2: 13) value based on said number of pixels (number of pixels being calculated with integrator in fig. 2: 49); using the dark correction value to modify the digital pixel values of a second captured image (Sawachi discloses updating the reference value to be updated to a predetermined interval of images i.e. every image, so the correction value can be applied to the subsequent captured image) (Col. 2, lines 10-25; col. 3, lines 18-37; col. 4, lines 60-65; col. 5, line 22 – col. 6, lines 23; col. 6, line 48 – col. 7, line 16).

Regarding **claim 9**, Sawachi discloses an apparatus (Figs. 1 and 2) for correcting dark current in a solid-state image sensor (Fig. 1: 3) that produces digital images having pixel values, comprising: a) a dark level corrector (Microcomputer in fig. 2: 13) for

correcting the pixel values produced by the image sensor with a dark level correction value to produce dark level corrected pixel values; and b) a control system responsive to dark level corrected pixel values to adjust the dark level correction value to drive the number of pixels (Being calculated by integrator in fig. 2: 49) having values lower than a predetermined (Calculated by data comparator in fig. 2: 47) value chosen to represent dark scene content to a predetermined range (Col. 2, lines 10-25; col. 3, lines 18-37; col. 4, lines 60-65; col. 5, line 22 – col. 6, lines 23; col. 6, line 48 – col. 7, line 16).

Regarding **claim 11**, Sawachi discloses that the sensor captures a stream of digital images, and wherein the control system includes: means for sampling a digital image from the stream of dark current corrected digital images (See fig. 2); means for generating a count of the number of pixel values (Fig. 2: 49) in the sampled digital image that are less than a predetermined value; means for generating a dark level correction (Microcomputer in fig. 2: 13) value adjustment based on the pixel value count; and means (Fig. 2: 29 and 2 :37) for applying the adjustment to the dark level correction value (Col. 2, lines 10-25; col. 3, lines 18-37; col. 4, lines 60-65; col. 5, line 22 – col. 6, lines 23; col. 6, line 48 – col. 7, line 16).

Regarding **claim 12**, Sawachi discloses means for decimating the sampled digital image to produce a sub-sample of pixel values from the sampled image and wherein the means for generating a count employs the sub-sample of pixel values to generate the count (Col. 5, line 22 – col. 6, line 24).

Regarding **claim 16**, if the body of a claim fully and intrinsically sets forth all of the limitations of the claimed invention, and the preamble merely states, for example,

the purpose or intended use of the invention, rather than any distinct definition of any of the claimed invention's limitations, then the preamble is not considered a limitation and is of no significance to claim construction. The claim preamble must be read in the context of the entire claim. Therefore the computer program product was not considered as a limitation since is stated as an intended use in the preamble. See MPEP § 2111.02.

Sawachi discloses the a method and apparatus for correcting dark current in a solid state image sensor (Fig. 1: 3), performing the steps of: providing a dark current corrected digital image having pixel values that have been adjusted by a dark level correction value from a stream of digital images that have been generated by the image sensor; generating a count of the number of pixel values in the digital image that are less than a predetermined value (Using integrator in fig. 2: 49); generating a dark level correction value adjustment based on the pixel value count (Using microcomputer in fig. 2: 13); and applying the adjustment to the dark level correction value (Using clamp circuits in fig. 2: 29 and 2: 37 based on data comparator in fig. 2: 47 to adjust the correction value).

Regarding **claim 17**, Sawachi discloses a step of decimating the sampled digital image to produce a sub- sample of pixel values from the sampled image and employing the sub-sample of pixel values to generate the count (Col. 5, line 22 – col. 6, line 24).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 2 and 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawachi, US Patent 5,512,947 in view of Salcedo, US Patent 6,774,942 B1.

Regarding **claim 2**, Sawachi does not explicitly disclose that the control system limits the adjustment to the dark current correction to a predetermined range around a factory calibration value, whereby the control system is prevented from overcorrecting.

However, Salcedo teaches a black level correction calibration system, wherein the system compares a comparison circuit (Fig. 1: 4) compares the value of the pixel with two predetermined thresholds values so as to adjust the black level correction based value based on said predetermined threshold values, the range around a factory calibration for correcting the dark current is inherent in Salcedo (Col. 3, line 1 – col. 4, line 34; also col. 1, line 59 – col. 2, line 12).

Therefore, taking the combined teaching of Sawachi in view of Salcedo as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sawachi by comparing the value of the pixel with two predetermined thresholds values so as to adjust the black level correction based value on said predetermined threshold values. The motivation to do so would help the system

to converge and remain stable, and to suppress the effects of noise as suggested by Salcedo (Col. 2, lines 6-13).

Regarding **claim 10**, Sawachi does not explicitly disclose that the control system includes means for limiting the adjustment to the dark current correction to a predetermined range around a factory calibration value, whereby the control system is prevented from overcorrecting.

However, Salcedo teaches a black level correction calibration system, wherein the system compares a comparison circuit (Fig. 1: 4) compares the value of the pixel with two predetermined thresholds values so as to adjust the black level correction based value based on said predetermined threshold values, the range around a factory calibration for correcting the dark current is inherent in Salcedo (Col. 3, line 1 – col. 4, line 34; also col. 1, line 59 – col. 2, line 12).

Therefore, taking the combined teaching of Sawachi in view of Salcedo as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sawachi by comparing the value of the pixel with two predetermined thresholds values so as to adjust the black level correction based value on said predetermined threshold values. The motivation to do so would help the system to converge and remain stable, and to suppress the effects of noise as suggested by Salcedo (Col. 2, lines 6-13).

Allowable Subject Matter

6. Claims **5-7, 13-15** and **18-20** objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims **5, 13** and **18**, the main reason for indication of allowable subject matter is because the prior art fails to teach or reasonably suggest that the step of generating a count includes the steps of generating a histogram of the pixel values in the sub-sample and summing bins in the histogram from zero to the predetermined value.

Regarding claim **7, 15** and **20**, the main reason for indication of allowable subject matter is because the prior art fails to teach or reasonably suggest that the dark level correction value adjustment increases the dark level correction value when the count is lower than a first predetermined value; decreases the dark level correction value when the count is higher than a second predetermined value; and does not change the dark level correction value when the count is between the first and second predetermined values.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nelson D. Hernandez whose telephone number is (571) 272-7311. The examiner can normally be reached on 8:30 A.M. to 6:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy R. Garber can be reached on (571) 272-7308. The fax phone

number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nelson D. Hernandez
Examiner
Art Unit 2612

NDHH
March 5, 2005

W. Garber
WENDY R. GARBER
SUPPLY PATENT EXAMINER
TECHNOLOGY CENTER 2600